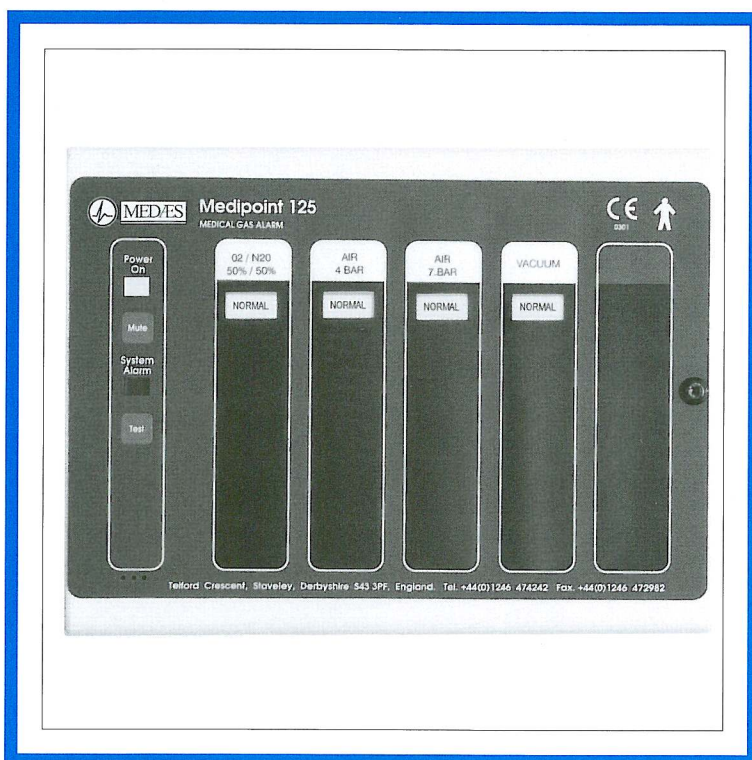
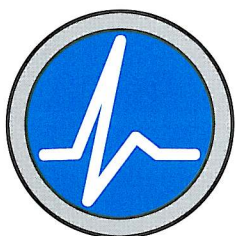


Operating and Maintenance Instructions



Medipoint® 125 Medical Gas Central Alarm



MEDAES

Operating and Maintenance Instructions

MEDIPOINT 125 MEDICAL GAS CENTRAL ALARM

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0. SAFETY, STORAGE AND HANDLING DATA

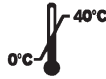
This section gives safety, storage, and handling information for Hill-Rom MEDÆS Ltd. Medipoint 125 medical gas central alarm. Circuit diagrams, component parts lists and descriptions are available on request.

0.1 Identification of symbols

The following standard symbols apply to this product. The meanings of these symbols are as specified below: -



- Read instructions



- Temperature range



- Date of manufacture (Year/Month)



- 3 phase alternating current with neutral conductor



- Protected earth connection



- Type B applied part (as per BSEN60601-1: 1990)



- Dangerous voltage

0.2 Environmental Transport and Storage Conditions

Minimum ambient temperature - 0 degrees Celsius
Maximum ambient temperature - 40 degrees Celsius
Minimum relative humidity (non-condensing) - 10%
Maximum relative humidity (non-condensing) - 95%

Environmental Operating Conditions

Minimum ambient temperature - 0 degrees Celsius
Maximum ambient temperature - 40 degrees Celsius
Minimum relative humidity (non-condensing) - 10%
Maximum relative humidity (non-condensing) - 95%
Atmospheric pressure range - 700-1100 hPa

0.3 Environmental Protection

Discard the unit and/or components in any standard refuse facility. The unit does not contain any hazardous substances.

0.4 Electromagnetic Interference

The panel has been tested to BSEN60601-1-2: 1993 Medical electrical equipment - electromagnetic compatibility - requirements and tests. Ensure all input and data cables are physically separated from other mains and data cables.

0. SAFETY, STORAGE AND HANDLING DATA

continued

0.5 Cleaning

The panel should be wiped over frequently with a damp cloth to remove any dust or foreign substances.

0.6 Electrical Details

WARNING...

IT IS NECESSARY TO CHECK THE INTEGRITY OF THE POWER SOURCE FOR SAFETY AT REGULAR INTERVALS. THESE CHECKS SHOULD BE CARRIED OUT ANNUALLY AND REPLACEMENT POWER SUPPLIES USED AS NECESSARY.

Power source

Mains operated using 110 or 230V, 50/60Hz, alternating current. The label adjacent to the mains connection shows whether the voltage is 110 or 230V.

Current requirements

3.0 amps

Type of protection against electric shock

Class 1 (Mains supplied equipment using a protected earth)

Mode of operation

Continuous (equipment may be left switched on indefinitely)

Degree of protection against ingress of liquids

IPX0 (Not protected)

Degree of mobility

Permanently installed (This unit is electrically connected by permanent means)

Degree of protection

Type B (no Applied Part or with an Applied Part not designed to meet F type (floating) requirements)

Degree of protection against flammable anaesthetic mixtures

Not protected (not suitable for use with flammable gases)

Rechargeable battery

The rechargeable battery (ref. no. 1828825) should be replaced every 5 years.

1. DESCRIPTION AND OPERATION

1.1 Introduction

The Hill-Rom MEDÆS Medipoint 125 medical gas central alarm system is designed to provide full monitoring of a complete medical gas installation throughout a hospital. Medipoint 125 medical gas central alarm systems consist of a central panel, which normally displays all monitored gas services with repeater panels in locations as specified by the customer. Inputs from the respective medical gas supply systems enter the alarm system at the nearest alarm panel, thereby reducing the installation costs. Information is transmitted for display throughout the system by means of an advanced data transmission circuit. Medipoint 125 medical gas central alarm systems provide a totally flexible alarm system which may be adapted to fully satisfy the requirements of any application. Programming is performed by switches within the panel and a system is normally programmed during build, however panels are easily programmed and systems can easily be modified or extended on site.

An individual Medipoint 125 alarm panel displays up to 5 gas services in a 'normal' and '4 stage' alarm conditions, or may be used to display a maximum of 20 'traditional' individual point alarms. Mounting multiple Medipoint 125 alarm panels in adjacent positions enables the Medipoint 125 central alarm system to monitor and display the required number of gas services. Facilities are incorporated to provide any combination of gas service or point alarm displays.

One Medipoint 125 alarm panel is designated the master panel for control purposes. Any number of panels may be programmed as a 'central panel' and cause all flashing displays on the system to change to steady when the MUTE switch on the central panel is operated. Each Medipoint 125 alarm panel connects directly with the mains electrical power supply and alarm panels are available for use with supplies of either 100V to 127V a.c. or 200V to 240V a.c. 50/60 Hz. Electrical power supplies should be from an essential circuit and fused at 3 Amps.

Each Medipoint 125 alarm panel incorporates flashing alarm displays, a POWER ON indication, a SYSTEM ALARM indication, MUTE and TEST switches and an audible warning programmed to operate depending upon the alarm condition displayed. Alarm panels are interconnected by data transmission cable. Relay interface units input conditions into existing alarm systems or building management systems are available.

1.2 Standards

The Hill-Rom MEDÆS Medipoint 125 medical gas central alarm system is specifically designed and manufactured to fully satisfy the National Health Service – Model Engineering Specification C11, and is therefore ideal for HTM2022 applications. Hill-Rom MEDÆS Medipoint 125 medical gas alarms are suitable for both United Kingdom and International markets, and are fully tested prior to dispatch and packaged to provide maximum protection during transit. Alarm panel printed circuit boards are designed to operate in an ambient temperature of between 0c and +50c. Component assemblies must be stored in their packaging in dry conditions and storage temperatures must be between 0°C and +50°C. Alarm panel enclosures provide protection to IP32 (BS5490) and are electrically bonded to earth to provide safe installation.

1.3 Alarm Panels

Each alarm panel consists of a first and second fix assembly, and are suitable for use with either surface or concealed installations. A bezel plate is provided for use with concealed installations and is fitted to the first fix assembly to give a neat appearance by covering the plaster joint. The front cover of the enclosure is hinged and retained by a special fastener which prevents unauthorised access. The assembly contains two printed circuit boards and provides a gas service display through windows in the front cover. The front cover has a flush dark finish polyester fascia to highlight the displays. Five columns of display windows indicate 'Normal' and '4 alarm conditions', for each gas service monitored. Displays are illuminated by coloured LED block indicators and have captions to indicate the gas service, 'Normal' and 'Alarm' conditions. The alarm panel also incorporates a green LED to indicate that the electrical power supply is ON, and a red LED to indicate an alarm system fault (SYSTEM ALARM). A MUTE switch is provided to mute the audible warning and a TEST switch is provided to test the internal circuits, LED's and audible warning within the panel. Overall dimensions are detailed at Table 1.

1. DESCRIPTION AND OPERATION

1.3 Alarm Panels continued

TABLE 1 : MEDIPOINT 125 – DIMENSIONS

	<i>Alarm Panel</i>	<i>Bezel</i>
Height (mm)	196.0	246.0
Length (mm)	260.0	310.0
Depth (mm)	61.2	18 swg
Chase depth (mm)	45.0	-

Gas service legends are printed on acetate strips, which slide into the alarm panel front cover through the uppermost internal slots. The correct combination of gas service legends must be fitted to satisfy the requirements of a particular location with blank strips fitted to display columns not used. Normal C11/HTM2022 legends are available as standard any special legends, point alarm legends etc. must be ordered as specials.

1.4 Visual displays

Coloured LED's fitted to the light display pcb provide the following visual displays:-

- 1.4.1 **Power On indication:-** is displayed by a green LED which is extinguished in the event of a power failure.
- 1.4.2 **System alarm indication:-** is displayed by a red LED which is normally extinguished. This red LED illuminates in a flashing mode to draw attention to any of the following failures:-
Alarm contact line fault (Sec .1.8).
Electrical power supply failure (powered by a standby battery).
Internal alarm failure.
Data transmission failure.
- 1.4.3 **Normal gas service indication:-** is displayed by a steady illuminated green LED which is extinguished in the event of an alarm condition
- 1.4.4 **Alarm conditions:-** are displayed by flashing LED's (yellow or red) to draw attention to the specific alarm condition.

All Flashing displays are programmed at sixty flashes per minute, i.e. 0.5 seconds on, 0.5 seconds off in accordance with C11 and HTM2022.

1.4.5 Display positions

To provide an aesthetic display and maintain consistency in accordance with recognised and established Medical gas service sequencing, it is recommended that displays are positioned in the following sequence on each alarm panel commencing with the left hand column:-

- Medical Oxygen (cryogenic and manifolds)
- Nitrous oxide (manifolds)
- Oxygen/Nitrous oxide (manifolds)
- Medical Air 400 kPa (plant and manifolds)
- Medical Air 700 kPa (plant and manifolds)
- AGS (simplex or duplex)
- Point alarms (as required)

When an alarm panel is required to display less than its maximum of 5 gas services, it is recommended that displays are positioned in accordance with the following:-

- | | |
|---------------|------------------------------|
| 1 Gas Service | Display column 3 |
| 2 Gas Service | Display column 2 and 3 |
| 3 Gas Service | Display column 2,3 and 4 |
| 4 Gas Service | Display column 1,2,3 and 4 |
| 5 Gas Service | Display column 1,2,3,4 and 5 |

1. DESCRIPTION AND OPERATION

continued

1.5 Test and Mute switches

TEST and MUTE switches require only gentle finger pressure. Operation of the TEST switch initiates the audible warning and illuminates (flashing) all the displays on the panel. This simple check proves the integrity of all LED's internal alarm circuits and audible warning. Given an alarm condition, operation of the MUTE switch silences the audible warning for 15 minutes.

CAUTION.....

The TEST and Mute switches must only be operated by gentle finger pressure.

Operation by the use of instruments, tools or other implements will cause damage to the switch.

1.6 Audible warning

The audible warning speaker fitted to the alarm panel front cover and connected to the light display pcb by plug and socket operates simultaneously with any specified alarm conditions or SYSTEM ALARM indication. The audible warning may be muted by pressing the MUTE switch. If following a mute condition another alarm condition occurs, the audible warning will operate simultaneously with the indication. Following a mute condition and a continuing alarm indication, the audible warning will re-sound after 15 minutes in accordance with HTM2022 and C11. When the audible resounds further operation of the MUTE switch is necessary to cancel the audible. Audible warning volume may be adjusted by means of a screwdriver slot in the rear face of the light display pcb.

If following an alarm condition no action is taken to MUTE the audible, the audible warning will automatically switch off when the alarm condition reverts to NORMAL. The audible tone consists of a modulation between two tones (F1 and F2). F1 = 440 Hz and F2 = 880Hz. The modulation rate is 4 Hz in accordance with HTM2022 and C11.

Audible warning may be 'permanently' disabled for specific alarm conditions during prolonged maintenance of plant or pipeline shut-down by operating the maintenance MUTE switch inside the alarm panel.

Operation of the MUTE switch on a central panel signifies that action is in hand to identify and rectify the fault which produced the alarm condition. This information is transmitted to all repeater panels displaying the gas service and the flashing visual display becomes steady, on all the respective display alarm panels.

1.7 Printed circuit boards

Two printed circuit boards (pcb's) are fitted inside a Medipoint 125 Medical gas area alarm, ie a power supply pcb and a light display pcb. All components are mounted on these pcb's which are interconnected by means of a multi-way ribbon cable and polarised connector. The Medipoint 125 internal electrical installation complies with all relevant British Standard specifications, IEE wiring regulations and current UK legislation.

1.7.1 Light display printed circuit board

The light display pcb is retained inside the alarm panel front cover with six retaining studs. This pcb contains 5 columns of 5 coloured LED block indicators, a green POWER ON and red SYSTEM ALARM LED block indicator. Each LED block indicator aligns with display windows in the front cover and fascia to provide a clear display. Each gas service indicator contains eight separate long life LED's connected in two banks of four, and both the POWER ON and SYSTEM ALARM LED contains four separate long life LED's connected in parallel in two banks of two. This duplex circuitry provides system reliability and ensures that illumination continues in the event of either a single LED or circuit failure. Each LED block indicator is a plug-in component enabling easy replacement or subsequent updating of the installation. The ribbon cable is permanently attached to the rear face of the light display pcb and enables interconnection of circuits with the power supply pcb. The audible warning speaker is connected by plug and socket to the light display pcb and locates within the alarm panel front cover when installed.

The light display pcb incorporates both rotary and DIL switches to allow easy programming of the alarm panel to suit all configurations (sec.1.12).

1. DESCRIPTION AND OPERATION

1.7 Printed circuit boards continued

1.7.2 Power supply printed circuit board

The power supply pcb is retained inside the alarm panel back box with four retaining studs and connects to the light display pcb multi-way ribbon cable by polarised connectors. The power supply pcb incorporates four mains terminals (EENL) connected to matching plug/socket combination to accept the mains electrical power supply, which preferably should be from an essential circuit, and enables connection of flying earth leads which electrically bond the assembly. The power supply pcb is programmed during build to accommodate the electrical power supply voltage which must be specified at order stage. A filter protects the alarm system from possible spikes or disturbances of the incoming electrical power supply and an integral transformer provides 15V and 5V d.c. supplies to operate the alarm circuits. Three fuses 20mm x 5mm to BS4265 protect the power supply circuits. F1 is rated at 500mA for 240V supplies and 1A for 120V supplies, F2 is rated 500mA and F3 is rated at 500mA. All mains power supply circuits and components are covered by a clear plastic shield, retained by two studs. A warning notice reminds personnel to isolate the electrical power supply prior to removal and maintenance. In order to prevent inadvertent cross connection, the mains electrical power supply plug and socket is not compatible with any other connection to the pcb.

The power supply printed circuit board incorporates a microprocessor which controls the operation of the alarm panel. A miniature 'maintenance' push button is fitted on the power supply pcb and is accessible with the alarm panel front cover open. With an alarm condition displayed, operation of this button 'permanently' disables audible reinstatement for that particular displayed alarm condition only. This facility is designed for use when the plant or pipeline is shut-off for a prolonged period. On returning the pipeline pressure to NORMAL this feature automatically re-sets without further manual selection.

The power supply pcb incorporates 5 input channels for connection to their respective inputs. Each channel (designated CH1 to CH5) incorporates 5 terminals (C – Common, 1, 2, 3 and 4) which are connected by matching plug/socket combination to accept signals from their respective inputs.

A relay (complete with line contact monitoring circuit) suitable for switching 50V and a maximum of 0.5 Amps is fitted to the power supply pcb. The normally energised relay has volt free, normally closed contacts and two terminals (N/O and C) enable connection by a matching plug/socket combination to either a Medipoint central alarm system or other suitable system. The line contact monitoring circuit can be de-selected by means of a jumper on LK4 located on the power supply pcb. The relay is de-energised and contacts open when any of the twenty alarm conditions are initiated. Terminals are also provided to enable connection of a remote audible warning device (+ and AL).

It is recommended that the input and data transmission cables are installed separate from the mains cable and maximum cable length between alarm panel and input should not exceed 100 Metres. Alarm panels accept a mains electrical power supply cable of 2.5 sq mm, and all other terminals accept a maximum cable size of 1.5 sq mm.

1.7.3 Standby battery

The power supply pcb also contains a standby battery, battery charging and power fail detection circuits. The battery provides power for both the SYSTEM ALARM indication and the audible warning in the event of an electrical power failure. The battery is fully charged after 72 hours and provides sufficient power to operate the specific alarm indications for a minimum of 4 hours. The battery is expected to have a minimum 5 years life.

1.8 Alarm contact line fault

CAUTION

Only Hill-Rom MED/ES line contact monitor modules should be fitted, otherwise the SYSTEM ALARM circuits could provide spurious indications.

Integrity of the interconnecting wiring and input sensors are constantly monitored by the SYSTEM ALARM detection circuits. The monitoring circuit is designed to detect an open or short circuit as well as normal operation of the pressure sensor. In the event of a line fault the NORMAL LED remains illuminated, the appropriate gas service alarm indicator and SYSTEM ALARM indicator will illuminate and the audible warning sounds. When a line contact fault is detected the flash rate of the affected circuit LED speeds up to show short circuit or slows to show open circuit when the TEST switch is operated. This facility is designed to aid fault diagnosis. Inputs must be 'normally closed' volt free contacts.

1. DESCRIPTION AND OPERATION

1.8 Alarm contact line fault continued

CAUTION

As the alarm panel monitors specific resistance values, only one input sensor (for each specific gas service) may be connected to an alarm panel. Similarly it is not possible to connect more than one alarm panel to a single input sensor.

1.9 Remote audible warning devices

Remote audible warning devices may be fitted in locations where warnings are necessary and alarm panels are not fitted. Remote audible warning devices are housed in a surface mounted enclosure containing a warning buzzer. The audible warning device is connected by input cable to the power supply pcb within the alarm panel (alarm terminals + and AL). When the alarm panel audible sounds the remote audible also sounds. A maximum of four remote audible warning devices can be fitted to an alarm panel and the cable length should not exceed 50 metres.

1.10 Medipoint 125 Relay interface panel

A dedicated relay interface panel assembly enables the Medipoint 125 medical gas central alarm system to be interconnected to an event recording circuit of a building management system, or other suitable alarm system. The relay interface unit is housed within a standard alarm panel enclosure and provides a fascia display of both POWER ON and SYSTEM ALARM. The relay interface panel incorporates a dedicated power supply pcb and a dedicated relay printed circuit board. The power supply pcb provides no-volt terminals (C, 1, 2, 3, 4) for each channel CH1 to CH5 to interconnect with a BMS system. The relay printed circuit board is similar to the standard light display board, except that the gas service alarm LED's are replaced by normally open low voltage relays. With the gas service operating normally, relay contacts are closed providing continuity between terminals C and 1, 2, 3, 4. In the event of a gas service failure the respective relay contacts open to break the continuity between terminals C and either 1, 2, 3 or 4. Relays are connected to the BMS system at terminals C, 1, 2, 3 and 4 and are rated at a maximum voltage of 50V d.c. with a maximum current of 50mA.

1.11 Operation of the alarm system

Each Medipoint 125 medical gas alarm panel is connected to the mains electrical power supply and operates by 15V and 5V d.c. circuits from it's integral transformer. Service failure sensors provide the input to initiate both the visual displays and audible warning. Programming of the panels is done via switches which can be easily adjusted on site from within the panel.

The Medipoint 125 medical gas panels use coloured LED's to indicate the service conditions. The green NORMAL indication is a steady light, whilst the service failure displays illuminate as flashing lights to draw attention to the failure. During normal conditions, the green NORMAL LED is illuminated. Should a service failure sensor open, the green (NORMAL) LED is extinguished and the appropriate service failure sensor is illuminated (flashing) together with an audible warning. The audible warning continues until either the MUTE switch is operated or the gas pressure returns to NORMAL. If the MUTE facility is operated and the alarm condition remains, the audible warning will re-sound after 15 mins and a further MUTE selection will be required. Should a further alarm condition occur after the panel has indicated a fault and has been muted, the audible warning is re-activated.

Operation of the TEST switch illuminates (flashing) all LED's and operates the audible warning.

The relay output (N/O and C) may be interconnected to a suitable system. The contacts are closed when all gas services are indicating NORMAL. In the event of any alarm condition, the relay contacts open, breaking the circuit to the remote system. The relay contacts remain open until all alarm conditions return to NORMAL condition. There is also a line contact monitor integral to the board available across the N/O and C contacts. To select this the jumper on LK4 is moved to the A position, for totally volt free contacts the jumper is moved to the B position.

The green POWER ON LED is normally illuminated and is extinguished in the event of an electrical power failure.

The red SYSTEM ALARM LED is normally extinguished and illuminates (flashing) together with an audible warning, in the event of any of the following failures:-

- Alarm contact line fault.
- Electrical power supply failure. (powered by standby battery).
- Internal alarm circuit failure.
- Data transmission failure.

1. DESCRIPTION AND OPERATION

1.1.1 Operation of the alarm system continued

When a line contact fault is detected, the NORMAL green LED remains illuminated, the respective alarm LED also illuminates (steady), and the SYSTEM ALARM LED illuminates (flashing) accompanied by an audible warning. Operation of the TEST switch illuminates all alarm LED's (flashing) and the flashing rate of the respective alarm LED indicates the type of fault. If the respective alarm LED flashes at a faster rate, this indicates a short circuit. If the respective alarm LED flashes at a slower rate, this indicates an open circuit. This facility is designed to aid fault diagnosis. The Medipoint 125 medical gas central alarm system logic is detailed at Table 2 and 3.

**TABLE 2
MEDIPOINT 125 ALARM LOGIC – INPUT PANEL TO REPEATER PANEL**

<i>Condition</i>	<i>Input Panel</i>	<i>Repeater Panel</i>
Normal	NORMAL (steady)	NORMAL (steady)
Alarm condition	Alarm (flashing) Audible if required.	Alarm (flashing) Audible if required.
Line contact fault	NORMAL (steady) Alarm (steady) SYSTEM ALARM (flashing) Audible Press TEST Switch Alarm flashes slower than other LED's to indicate an open circuit or faster to indicate a short circuit	Alarm (steady) SYSTEM ALARM (flashing) Audible
Power failure to input panel	SYSTEM ALARM (flashing) Audible	Input gas service channel, all alarms (flashing) SYSTEM ALARM (flashing) Audible
Data transmission break/failure between input and repeater panel	All input channels to panel displayed as normal All displayed gas services relayed from repeater panel all alarms illuminate (flashing) SYSTEM ALARM (flashing) Audible	All alarms for specific gas service illuminate (flashing) SYSTEM ALARM (flashing) Audible

**TABLE 2:
MEDIPOINT 125 ALARM LOGIC – REPEATER TO REPEATER PANEL**

<i>Condition</i>	<i>Left hand repeater panel</i>	<i>Right hand repeater panel</i>
Data transmission break/failure between panels	All gas services input from left hand side remain normal All gas services input from right hand side – all alarm conditions illuminate (flashing) SYSTEM ALARM (flashing) Audible	All gas services input from right hand side remain normal All gas services input from left hand side – all alarm conditions illuminate (flashing) SYSTEM ALARM (flashing) Audible
Power failure on left hand repeater panel	SYSTEM ALARM (flashing) Audible	Panel behaves normally
Power failure on right hand repeater panel	Panel behaves normally	SYSTEM ALARM (flashing) Audible

1. DESCRIPTION AND OPERATION

continued

1.12 Programming of the alarm system

The Medipoint 125 central alarm system panels are programmed by setting a series of DIL and rotary switches on the rear of the light display board (Fig. 1) as detailed in table 4. Rotary switches SW1 to SW5 assign the display columns to a specified input, or OFF. 1 to 9 correspond to 'normal' medical gas alarms, i.e. Normal + 4 alarm conditions with an audible on all alarm conditions except the 3rd. A to F correspond to 'point' alarms, i.e. Normal + 4 alarm conditions with an audible on all alarm conditions. 8-way DIL switch SW6 sets details specific to each panel. Rotary switch SW7 sets the panel ID. Similar switches are on the rear of the relay board (Fig. 2) in a Medipoint 125 relay interface panel.

The Medipoint 125 central alarm system works by identifying each individual gas channel or set of point alarm inputs with a unique ID and by identifying each panel with a unique ID. The rotary switches are hexadecimal i.e. A corresponds to 10, B corresponds to 11 etc. for purposes of panel IDs.

A channel must be set between 0 and F, 0 being OFF. 1 to 9 give normal gas alarms and A to F give point alarm characteristics. Therefore any one alarm system may have up to 9 sets of medical gas inputs and 6 sets (24 individual conditions) of point alarm inputs.

SW7 in conjunction with SW6-7 give each individual panel an ID between 0 and 31. The panel with the highest ID including Medipoint 125 Relay panels must be set as the MASTER panel (SW6-6 ON), all other panels must be set as slave panels (SW6-6 OFF). Therefore any one alarm system may contain up to 32 panels the highest number being set as the MASTER.

SW6-8 enables or disables the central mute facility, ON enabled, OFF disabled. If the central mute facility is to be used on a system the master panel must also be a central mute panel. When the mute switch is operated on a central mute panel displaying a fault condition the flashing light on all panels showing the same fault changes from flashing to steady.

NB there may be more than one central mute panel on a system (i.e. two central panels in the telephone exchange on a 10 gas system), but there must be one Master panel on the system and it must have the highest panel ID on the system.

SW6-1 to SW6-5 are used to identify where each channel is input onto the system. If SW6-2 is set to ON then this means that a particular gas or set of point alarms is input to this panel. On a complete system there should only be as many of these switches set to ON as there are "channels" on the complete system. When set to ON the alarm panel will look for a complete set of inputs, i.e. four fault conditions. If less than four inputs are been connected to a particular channel then the linking resistors provided must be used to "link out" the unused conditions. i.e. if a C11 vacuum plant is to be connected, then the input alarm conditions would be connected between Common, 1, 2 and 4. Therefore a linking resistor must be connected between Common and 3.

An alarm system is set up by allocating a number (1 to 9) or letter (A to F) to each set of plant inputs or point alarm inputs. Typically on a 4 gas system with point alarms:-

- 1 – Oxygen Manifold Alarms
- 2 – Nitrous Oxide Manifold Alarms
- 3 – Air Plant Alarms
- 4 – Vacuum Plant Alarms
- A – Ward 1 to 4 Point Alarms
- B – Ward 5 to 8 Point Alarms

Therefore on every panel where Oxygen is to be displayed the appropriate gas number switch (SW1 to SW5) is set to 1. Where inputs are connected into the system the appropriate DIL switch (SW6-1 to SW6-5) must be set ON.

i.e. If air and vacuum plant are both input into channels 2 and 3 on a two gas panel in the plant room, then SW2 must be set to 3 to display air plant, SW3 must be set to 4 to display vacuum plant. SW1, SW4 and SW5 must be set to 0. Also SW6-2 and SW6-3 must be set to ON to indicate that these alarms are input to this panel.

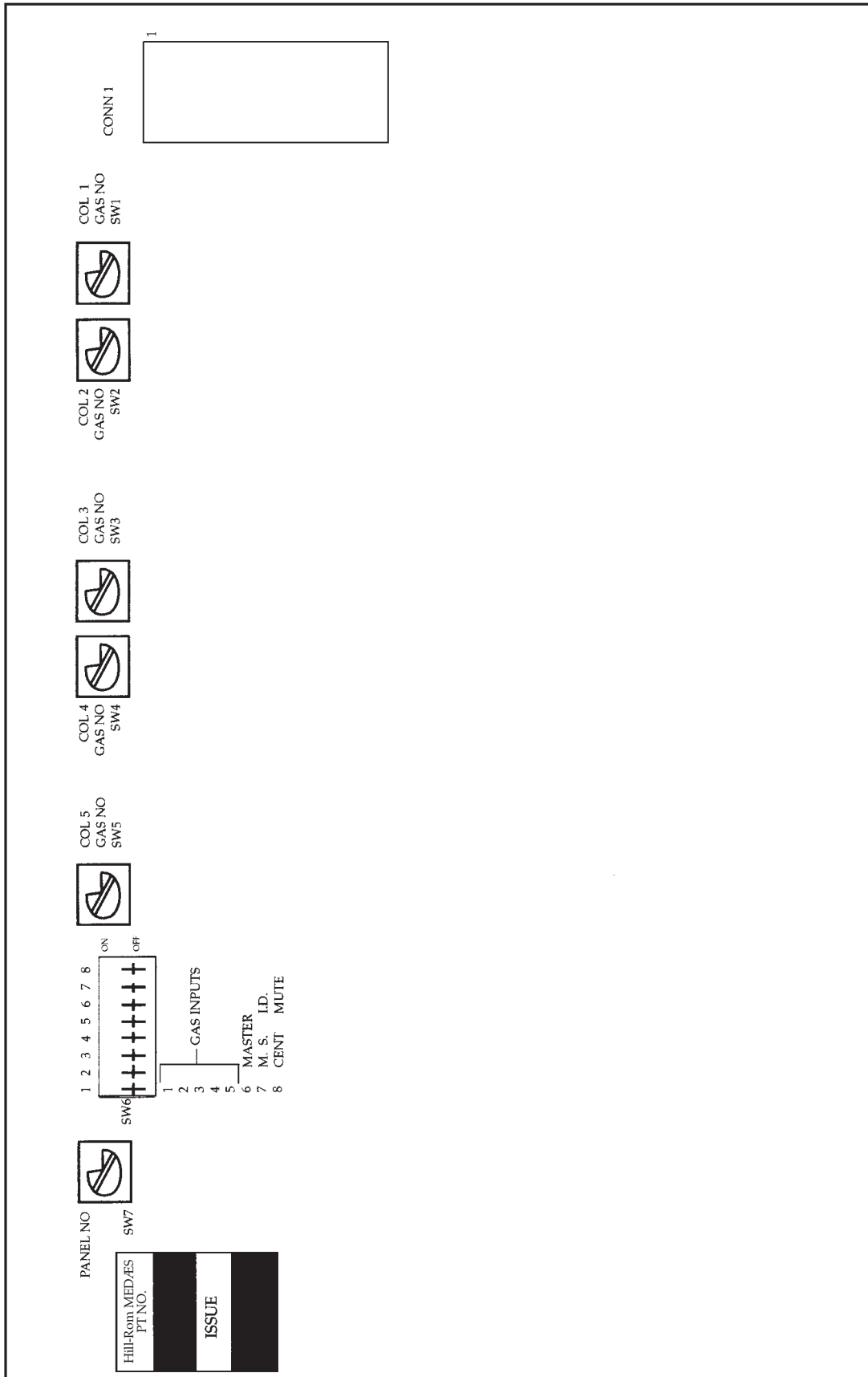


Figure 1
Light Display – Switch positions

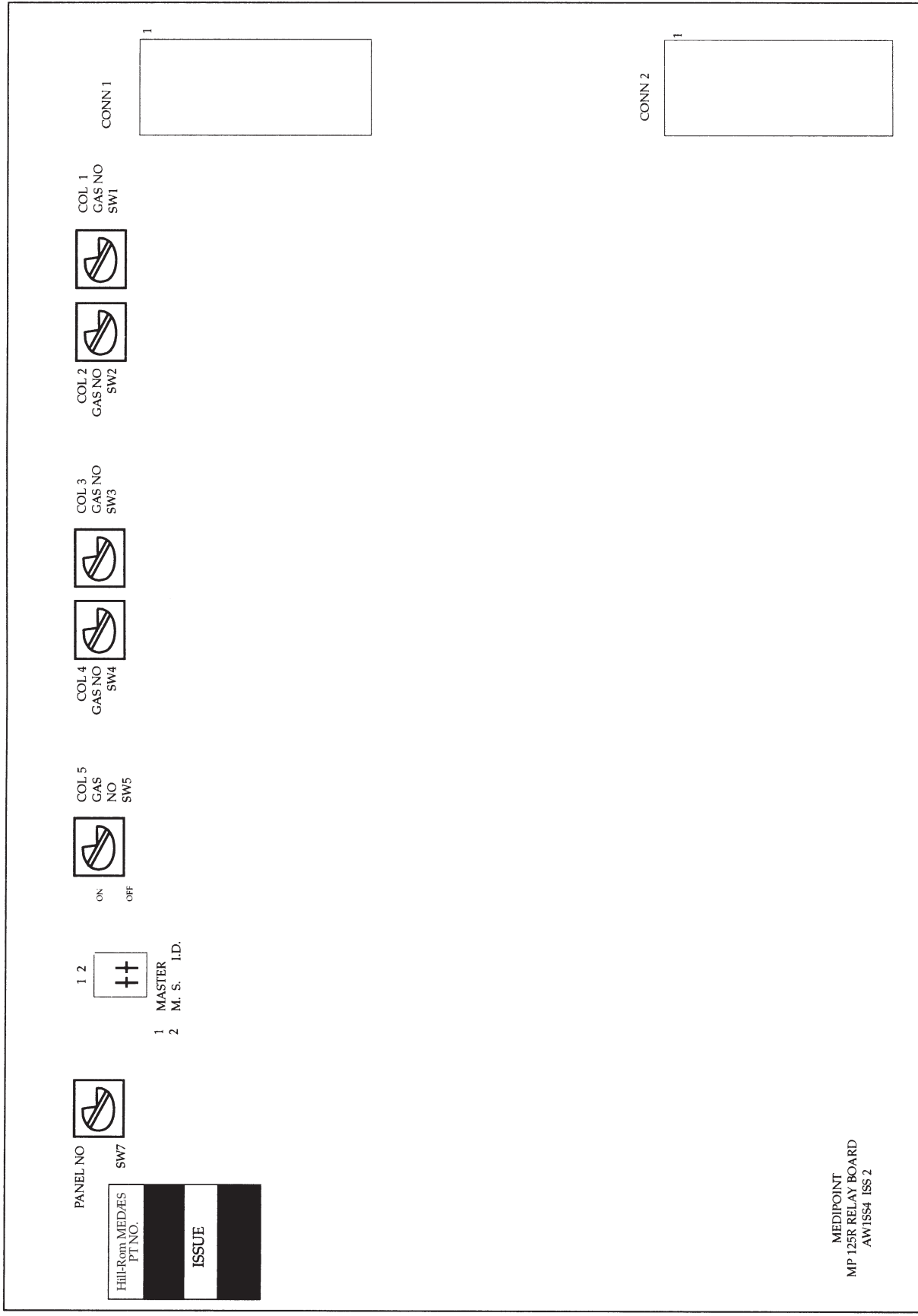
TABLE 4 : MEDIPOINT 125 PROGRAMMING

<i>Switch</i>	<i>Setting/description</i>
SW1	0 - Display channel 1 Off, gas display channel not used 1-9 - Display channel 1 Normal gas display HTM2022/C11 A-F - Display channel 1 Point alarm display
SW2	0 - Display channel 2 Off, gas display channel not used 1-9 - Display channel 2 Normal gas display HTM2022/C11 A-F - Display channel 2 Point alarm display
SW3	0 - Display channel 3 Off, gas display channel not used 1-9 - Display channel 3 Normal gas display HTM2022/C11 A-F - Display channel 3 Point alarm display
SW4	0 - Display channel 4 Off, gas display channel not used 1-9 - Display channel 4 Normal gas display HTM2022/C11 A-F - Display channel 4 Point alarm display
SW5	0 - Display channel 5 Off, gas display channel not used 1-9 - Display channel 5 Normal gas display HTM2022/C11 A-F - Display channel 5 Point alarm display
SW6	1- OFF Channel 1 display not input at this panel ON Channel 1 display input to this panel 2- OFF Channel 2 display not input at this panel ON Channel 2 display input to this panel 3- OFF Channel 3 display not input at this panel ON Channel 3 display input to this panel 4- OFF Channel 4 display not input at this panel ON Channel 4 display input to this panel 5- OFF Channel 5 display not input at this panel ON Channel 5 display input to this panel 6- OFF to designate panel as slave ON to designate panel as master (must be highest ID on system) 7- OFF for panel ID 0 to 15 ON or panel ID 16-31 8- OFF to disable central mute facility ON to enable central mute facility (normally telephone exchange)
SW7	0 – F Sets panel ID 0 to 15 or 16 to 31 in conjunction with SW6-7

NB if the central mute facility is utilised then the master panel must be set to central mute ON.

TABLE 5 : MEDIPOINT 125 RELAY INTERFACE PROGRAMMING

<i>Switch</i>	<i>Setting/description</i>
SW1	0 - Relay channel 1 Off, gas display channel not used 1-9 - Relay channel 1 Normal gas display HTM2022/C11 A-F - Relay channel 1 Point alarm display
SW2	0 - Relay channel 2 Off, gas display channel not used 1-9 - Relay channel 2 Normal gas display HTM2022/C11 A-F - Relay channel 2 Point alarm display
SW3	0 - Relay channel 3 Off, gas display channel not used 1-9 - Relay channel 3 Normal gas display HTM2022/C11 A-F - Relay channel 3 Point alarm display
SW4	0 - Relay channel 4 Off, gas display channel not used 1-9 - Relay channel 4 Normal gas display HTM2022/C11 A-F - Relay channel 4 Point alarm display
SW5	0 - Relay channel 5 Off, gas display channel not used 1-9 - Relay channel 5 Normal gas display HTM2022/C11 A-F - Relay channel 5 Point alarm display
SW6	1- OFF to designate panel as slave ON to designate panel as master (must be highest ID on system) 2- OFF for panel ID 0 to 15 ON for panel ID 16-31
SW7	0 – F Sets panel ID 0 to 15 or 16 to 31 in conjunction with SW6-2



MEDIFPOINT
 MP 125R RELAY BOARD
 AW1554 ISS 2

Figure 2
 Relay Panel – Switch positions

2. COMMISSIONING

2.1 Introduction

Commissioning of the Medipoint 125 medical gas central alarm installation is carried out in full after initial installation and the appropriate sections must be carried out after a major component change. The object of commissioning is to ensure that all components are serviceable and correctly programmed. The commissioning procedure also ensures that anti-confusion checks are carried out and that the correct gas service is displayed in the designated column. Personnel carrying out the following commissioning procedure must be qualified and fully conversant with the information contained in this manual.

WARNING...

BEFORE COMMENCING THE COMMISSIONING PROCEDURE ENSURE THAT ALL INSTALLATION PROCEDURES ARE COMPLETE AND THAT ALL WIRING IS CORRECTLY CONNECTED. BEFORE SWITCHING ON THE MAINS ELECTRICAL POWER SUPPLY, ENSURE THE SUPPLY IS CORRECTLY FUSED.

2.2 Functional tests

When all alarm panels have been installed and connected, the following functional checks must be carried out on every alarm panel in the systems. Commence the procedure at alarm panels which receive an input and progress until all 'input' panels are proven. Carry out the procedure on the 'central' panel(s). Repeat the procedure on all 'repeater' panels including those previously checked as input panels, Ensure that all gas service displays and all alarm panels are proven.

2.3 Alarm panel. Check internal connections.

Check the multi-way ribbon cable is correctly connected.

2.4 Electrical power supply. Switch ON.

Switch ON electrical power supply to alarm panel. Check that the POWER ON LED illuminates.

2.5 Alarm panel. Test.

Press the TEST switch and check that all the alarm panels LED's illuminate (flashing) and the audible warning sounds.

2.6 Gas service. Check alarm conditions.

Taking each gas service in turn, ensure that the NORMAL indication is illuminated in the correct display column on all panels displaying that gas service, when the gas service is set to work normally. Set the gas service to introduce the 1st, 2nd, 3rd and 4th alarm conditions and ensure that the correct alarm light illuminates in each case. Throughout the procedure, ensure that the LED's are the correct colour and gas service legends are correct and in accordance with the correct specification. This check must be carried out on all panels displaying that particular gas service.

2.7 Audible warning. Check.

Whilst carrying out Step 2.2.4, ensure that audible warning sounds for the appropriate alarm conditions. Ensure the operation of the MUTE switch cancels the audible and that the audible comes on again after approximately 15 minutes.

2.8 Remote audible. Check.

Check that all remote audibles operate whenever there is an alarm condition on it's parent panel. Check that the remote audible is silenced by operation of the MUTE switch on parent panel.

2.9 Relay interface panel. Check

If a relay interface panel is used with the alarm system, it's operation must be checked whilst checking each gas service status applicable to the panel (Step 2.2.4). With a gas service operating 'normally' the appropriate relay should be energised and it's 'normally open' contacts should be closed.

2. COMMISSIONING

continued

2.10 SYSTEM ALARM indication. Check

The procedure for checking that the SYSTEM ALARM circuits are operating correctly is as follows, and should be carried out on all alarm panels:-

2.10.1 Electrical power supply. Switch OFF

2.10.2 Indications. Check.

Check that POWER ON LED is extinguished and SYSTEM ALARM LED is illuminated (flashing), accompanied by an audible warning, after 15 seconds. If the panel receives an input, ensure that the gas display on all panels displaying that particular gas service have illuminated (flashing) LED's for all input alarm stages and the SYSTEM ALARM LED illuminates with an audible warning.

2.10.3 Electrical power supply. Switch ON.

Ensure that all indications return to NORMAL, including displays on repeater panels.

2.10.4 Alarm panel front cover. Open

2.10.5 Line contact monitoring. Check open circuit.

Disconnect input plug from gas service channel on power supply pcb. Check that the respective gas service channel indicates NORMAL and that all 'alarm conditions' are steady illuminations. Check that SYSTEM ALARM LED illuminates (flashing) accompanied by an audible warning. Press the TEST switch and ensure that all alarm LED's flash at a slower rate than other displays. Check that all repeater panels which display that input indicate all 'alarm conditions' and SYSTEM ALARM in a flashing mode.

2.10.6 Input. Reconnect.

Reconnect the input plug to gas channel ensure that all indications are NORMAL. Repeat with all other inputs.

2.10.7 Line contact monitoring. Check short circuit.

Using a small piece of wire as a shorting link, short out input terminals (C and either terminal 1, 2, 3 or 4 as applicable). Check that the respective gas service display indicates NORMAL and that the respective 'alarm condition' illuminates (steady). Check that the SYSTEM ALARM LED illuminates (flashing) accompanied by an audible warning. Press the TEST switch and ensure that the respective 'alarm condition' flashes at a faster rate than other displays.

2.10.8 Shorting link. Remove.

Remove shorting link and repeat Step 2.10.7 with all other inputs. On completion, ensure that all indications are NORMAL.

2.10.9 Alarm panel front cover. Close and secure.

2.11 Central alarm panel(s). Check MUTE operation.

With an alarm condition illuminated in flashing mode, operate MUTE switch on central panel. Check all repeater panels displaying that alarm condition revert to a steady alarm indication.

2.12 Alarm system. Set.

Ensure that all alarm panels are closed and secured. Ensure that each gas service installation is operating normally and only NORMAL indications are displayed.

3. OPERATING INSTRUCTIONS

WARNING...
ANY ALARM CONDITION MUST BE INVESTIGATED AND THE GAS SERVICE RETURNED TO NORMAL AS SOON AS POSSIBLE

CAUTION...
The TEST and MUTE switches must only be operated by gentle finger pressure. Operation by use of instruments, tools or other implements will cause damage to the switch.

3.1 General operation

During normal conditions the green (normal) LED's are illuminated. Should a service failure sensor operate, the green (normal) LED is extinguished and the appropriate alarm mode LED (yellow or red) is illuminated and the audible warning sounds, if required. The audible warning will continue until either the MUTE switch is pressed or the gas service is returned to normal. If the mute facility is operated, the audible warning will re-sound after 15 mins, until either the MUTE switch is re-selected or the gas service is returned to normal. Should a further alarm condition occur after the panel has indicated an alarm and has been muted, the audible warning is re-activated.

3.2 System Alarm light

Should the SYSTEM ALARM light illuminate, a fault within the alarm system has occurred. The fault must be investigated and rectified immediately.

3.3 Test switch operation

Pressing the TEST switch illuminates (flashing) all LED's within a panel and sounds the audible warning.

3.4 Mute switch operation

Operation of the MUTE switch following an alarm condition will switch off the audible warning. The audible warning will resound after 15 mins until either the MUTE switch is re-selected or the gas service returns to NORMAL.

4. MAINTENANCE

4.1 Introduction

Medipoint 125 medipoint gas central alarm systems are designed to operate with the minimum of maintenance, however regular minor maintenance operations are recommended to prove the system integrity. Maintenance operations are carried out in accordance with the planned preventative maintenance contract purchased by the customer. Maintenance engineers must fully understand the alarm system and must be conversant with the information contained in this manual.

WARNING

OBTAIN A WORK PERMIT BEFORE COMMENCING ANY WORK ON A MEDICAL ALARM SYSTEM.

4.2 Tools and equipment

Except for the special key provided, no special tools are required, however common hand tools are required and they must be clean and serviceable. All necessary spare parts must be obtained before commencing work.

4.3 Customer recommended maintenance

The following routine operations are the recommended minimum:-

4.4 Weekly inspection

Press the TEST button on each alarm panel and ensure that all LED displays illuminate (flashing) and the audible warning sounds. If the remote audible is connected to the alarm panel, ensure that it operates simultaneously with the panel.

4.5 Quarterly inspection

The quarterly inspection proves the integrity of the interconnecting wiring between each gas service failure sensor and input alarm panel, the line contact monitoring circuits and the integrity of the internal alarm panel circuits and interconnecting data transmission cable. The quarterly inspection must be carried out on all alarm panels and consists of the following operations:-

4.5.1 Electrical power supply. Switch OFF.

4.5.2 Indications. Check.

Check that POWER ON LED is extinguished and the SYSTEM ALARM LED is illuminated (flashing), accompanied by an audible warning. If the alarm panel receives an input, ensure that each panel displaying that gas service have illuminated (flashing) LED's for all input alarm stages, and the SYSTEM ALARM LED illuminates with an audible warning.

4.5.3 Electrical power supply. Switch ON.

Ensure that all indications return to NORMAL including displays on repeater panels.

4.5.4 Alarm panel front cover. Open.

4.5.5 Line contact monitoring. Check open circuit.

Disconnect input plug from gas service channel on power supply pcb. Check that the respective gas service channel indicates NORMAL and all 'alarm conditions' are steady illuminations. Check that SYSTEM ALARM LED illuminates (flashing) accompanied by an audible warning. Press the TEST switch and ensure that all 'alarm conditions' flash at a slower rate than other displays. Check that all repeater panels which display that input indicate all input 'alarm conditions' and SYSTEM ALARM in a flashing mode.

4.5.6 Input. Reconnect.

Reconnect the input plug to gas channel. Repeat Step 4.5.5 with all other inputs. On completion, ensure that all input plugs are correctly connected and all indications are NORMAL.

4.5.7 Line contact monitoring. Check short circuit.

Using a small piece of wire as a shorting link, short out input terminals (C and either 1, 2, 3 or 4 as applicable). Check that the respective gas service display indicates NORMAL and that the respective 'alarm condition' LED illuminates (steady). Check that the SYSTEM ALARM LED illuminates (flashing) accompanied by an audible warning. Press the TEST switch and ensure that the respective 'alarm condition' LED flashes at a faster rate than other displays.

4.5.8 Shorting link. Remove.

Remove shorting link and repeat Step 4.5.7 with all other inputs. On completion, ensure that all indications are NORMAL.

4. MAINTENANCE

4.5 Quarterly inspection continued

- 4.5.9 **Remote audible. Check.**
If a remote audible is connected to the alarm panel, ensure that whilst carrying out Step 4.5.5 remote audible warning operates correctly.
- 4.5.10 **Relay interface. Check.**
If the relay interface is connected, ensure that whilst carrying out Step 4.5.5 the relay contacts operate (open) with any failure display.
- 4.5.11 **Audible warning. Check.**
With an alarm indication displayed and audible muted (Step 4.5.5) ensure that the audible re-sounds after approximately 15 minutes.
- 4.5.12 **Alarm panel front cover. Close and secure.**

4.6 Annual Inspection

The annual inspection proves the correct settings of each gas service sensor and should be carried out in accordance with Sec. 2.2 to 2.12 inclusive.

4.7 LED indicator replacement

A failed LED block indicator is shown by a dim or a half block illumination which appears in a bar form. Each LED block is a plug-in component and is replaced using the following procedure.

CAUTION...

To prevent damage to printed circuit boards, handle with care and do not overtorque retaining nuts.

- 4.7.1 **Electrical power supply. Switch OFF.**
- 4.7.2 **Alarm panel front cover. Open.**
- 4.7.3 **Light display pcb. Disconnect.**
Disconnect the multi-way ribbon connector at the power supply pcb. Disconnect the audible from the Light display pcb.
- 4.7.4 **Light display pcb. Remove.**
Remove and retain the securing nuts. Gently remove light display pcb taking care to retain plastic spacers and washers which may be displaced from securing studs.
- 4.7.5 **LED. Replace**
Gently unplug LED from connector and replace with a compatible LED of the same colour. The new LED must be plugged into the connector with the part number facing the bottom of the board.
- 4.7.6 **Light display pcb. Re-fit.**
Ensure that a plastic spacer and washer is fitted to each securing stud and gently align light display pcb over studs with LED block indicators aligned with display windows. Refit a nut to each securing stud and tighten just sufficiently to retain pcb.
- 4.7.7 **Light display pcb. Reconnect.**
Reconnect the multi-way ribbon connector at the power supply pcb. Reconnect the audible to the light display pcb.
- 4.7.8 **Alarm panel front cover. Close.**
Taking care not to trap the ribbon cable, close the panel front cover and secure with special fastener.
- 4.7.9 **Electrical power supply. Switch ON.**
- 4.7.10 **Alarm panel. TEST.**
Ensure that POWER ON LED is illuminated and SYSTEM ALARM LED is extinguished. Press TEST switch and ensure all LED's illuminate (flashing) and audible warning operates.

4.8 Replacing a light display printed circuit board.

The procedure to replace a light display pcb is as follows:-

CAUTION...

Printed circuit boards are susceptible to damage by static electricity and must remain enclosed in their anti-static packaging until immediately required for use. Removed printed circuit boards must be placed in their anti-static packaging immediately on removal. To prevent damage to printed circuit boards, handle with care and do not overtorque retaining nuts.

4. MAINTENANCE

4.8 Replacing a light display printed circuit board

continued

- 4.8.1 Electrical power supply. Switch OFF.
- 4.8.2 Alarm panel front cover. Open.
- 4.8.3 Light display pcb. Disconnect.
Disconnect the multi-way ribbon connector at the power supply pcb. Disconnect the audible from the light display pcb.
- 4.8.4 Light display pcb. Remove.
Remove and retain the securing nuts. Gently remove light display pcb taking care to retain plastic spacers and washers which may be displaced from securing studs.
- 4.8.5 Replacement light display pcb. Prepare.
Fit and correct coloured LED indicators to the display columns used in the installation. Any display column not used should not have LED's fitted. LED indicators must be plugged into the connector with the part number facing the bottom of the board. Set all the switches on the replacement pcb as the original pcb.
- 4.8.6 Light display pcb. Fit.
Ensure that a plastic spacer and washer is fitted to each securing stud and gently align light display pcb over studs with LED block indicators aligned with display windows. Refit a nut to each securing stud and tighten just sufficiently to retain pcb.
- 4.8.7 Light display pcb. Connect.
Reconnect the multi-way ribbon connector at the power supply pcb. Reconnect the audible to the light display pcb.
- 4.8.8 Alarm panel front cover. Close.
Taking care not to trap the ribbon cable, close the panel front cover and secure with special fastener.
- 4.8.9 Electrical power supply. Switch ON.
- 4.8.10 Alarm panel. Test.
Ensure that POWER ON LED is illuminated and SYSTEM ALARM LED is extinguished. Press TEST switch and ensure all LED's illuminate (flashing) and audible warning operates.

4.9 Replacing a power supply printed circuit board.

The procedure to replace a power supply pcb is as follows:-

WARNING...

ENSURE THAT THE MAINS ELECTRICAL POWER SUPPLY IS OFF AND REMAINS ISOLATED UNTIL REQUIRED FOR THE FUNCTIONAL CHECKS.

CAUTION...

Printed circuit boards are susceptible to damage by static electricity and must remain enclosed in their anti-static packaging until immediately required for use. Removed printed circuit boards must be placed in their anti-static packaging immediately on removal. To prevent damage to printed circuit boards, handle with care and do not overtorque retaining nuts.

- 4.9.1 Electrical power supply. Switch ON.
- 4.9.2 Alarm panel front cover. Open.
- 4.9.3 Power supply pcb. Disconnect.
Disconnect the multi-way ribbon connector at the power supply pcb.
- 4.9.4 Terminals. Unplug.
Unplug all the input and data connectors except the power supply connector. Make note of the respective positions of all the input connectors.
- 4.9.5 Electrical power supply terminal. Unplug.
Ensure that the electrical power supply is OFF and properly isolated (mains fuse removed). Remove clear plastic cover from power supply pcb and disconnect electrical power supply terminal.
- 4.9.6 Power supply pcb. Remove.
Remove and retain the securing nuts and washers. Gently remove power supply pcb taking care to retain plastic spacers which may be displaced from securing studs.
- 4.9.7 Replacement power supply pcb. Fit.
Ensure that a plastic spacer is fitted over each securing stud and gently align the power supply pcb over the retaining studs in the back box. Refit washers and nuts to each securing stud and tighten just sufficiently to retain pcb.

4. MAINTENANCE

4.9 Replacing a power supply printed circuit board continued

- 4.9.8 **Electrical power supply terminal. Reconnect.**
Plug in the power supply connector. Refit clear plastic cover.
- 4.9.9 **Terminals. Reconnect.**
Plug in all the other terminals in the respective positions from which they were unplugged.
- 4.9.10 **Power supply pcb. Reconnect**
Reconnect the multi-way ribbon connector at the power supply pcb.
- 4.9.11 **Alarm panel front cover. Close.**
Taking care not to trap the ribbon cable, close the panel front cover and secure with special fastener.
- 4.9.12 **Electrical Power supply. Switch ON.**
- 4.9.13 **Alarm Panel. Test.**
Check out both weekly and quarterly inspection in accordance with Sec. 4.4 and 4.5.

4.10 Replacing a back up battery

The procedure to replace a back up battery is as follows:-

WARNING...

ENSURE THAT THE MAINS ELECTRICAL POWER SUPPLY IS OFF AND REMAINS ISOLATED UNTIL REQUIRED FOR THE FUNCTIONAL CHECKS.

- 4.10.1 **Electrical power supply. Switch OFF.**
- 4.10.2 **Alarm panel front cover. Open.**
- 4.10.3 **Back up battery. Disconnect.**
Unplug the back up battery connector. Carefully unfasten the ties retaining the back up battery and remove the battery.
- 4.10.4 **Replacement battery. Fit.**
Hold the replacement back up battery in position and secure with ties. Connect the back up battery connector.
- 4.10.5 **Alarm panel front cover. Close.**
Taking care not to trap the ribbon cable, close the panel front cover and secure with special fastener.
- 4.10.6 **Electrical power supply. Switch ON.**

5. FAULT DIAGNOSIS

5.1 Introduction

The following tables detail possible defects/symptoms which may occur with the Medipoint 125 medical gas central alarm system, with the necessary rectification action.

TABLE 6 : TEST OR MUTE SWITCH FAILS TO OPERATE

<i>Possible cause</i>	<i>Remarks/rectification action</i>
1. Faulty switches	Replace the light display pcb (Para 4.8)

TABLE 7 : SINGLE LED INDICATOR FAILS TO ILLUMINATE

<i>Possible cause</i>	<i>Remarks/rectification action</i>
1. Faulty LED indicator	Replace LED (Para 4.7)
2. Faulty light display pcb.	Replace light display pcb (Para 4.8)

TABLE 8 : ALARM PANEL LOSES ALL DISPLAYS EXCEPT SYSTEM ALARM

<i>Possible cause</i>	<i>Remarks/rectification action</i>
1. Mains electrical power supply failure	Check mains electrical power supply into the panel
2. Power supply fuses blown	Check condition of fuses on power supply pcb. Replace as necessary
3. Main ribbon connector faulty	Check main ribbon connector on power supply pcb. Replace power supply pcb as necessary (Para 4.9).
4. Main ribbon damaged	Check main ribbon cable. If damaged replace light display pcb (Para 4.8)
5. Power supply pcb faulty	Replace power supply pcb (Para 4.9)
6. Light display pcb faulty	If all other checks have failed to rectify the fault, replace the light display pcb (Para 4.8)

5. FAULT DIAGNOSIS

continued

TABLE 9 : SYSTEM ALARM/FAULT INDICATION WITH A SERVICEABLE GAS

<i>Possible cause</i>	<i>Remarks/rectification action</i>
1. Electrical power failure	Check POWER ON indication is illuminated and other indications are normal
2. Gas service pressure . incorrect	Independently check gas service pressure in area being monitored
3. Pressure switch stuck in fail position	Check resistance of interconnecting wiring, line monitor module and pressure switch. (180 +/- 5% ohms with contacts closed) (690 +/- 5% ohms with contacts open) If value is incorrect check continuity exists through pressure switch. Check pressure switch adjustment and replace switch as necessary, complete with line contact module
4. Wiring defect between panel and pressure switch	With a serviceable pressure switch fitted, check resistance of interconnecting wiring and line monitor module (< 10 ohms indicates a short circuit or > 5K ohms indicates an open circuit). Locate wiring defect, repair as necessary or replace line monitor module.
5. Main ribbon connector faulty	Check main ribbon connector on power supply pcb. Replace power supply pcb as necessary (Para 4.9)
6. Main ribbon damaged	Check main ribbon cable. If damaged replace light display pcb (Para 4.8)
7. Power supply pcb faulty	Replace power supply pcb (Para 4.9)
8. Light display pcb faulty	If all other checks have failed to rectify the fault, replace the light display pcb (Para 4.8)

5. FAULT DIAGNOSIS

continued

TABLE 10 :
REMOTE ALARM/RECORDING SYSTEM NOT OPERATING CORRECTLY

<i>Possible cause</i>	<i>Remarks/rectification action</i>
1. LK4 set incorrectly	Check that the jumper on LK4 is set to the correct position (Sec 1.10)
2. Faulty interface relay	<p>With all gas services indicating NORMAL, check that continuity exists between both relay terminals (N/O and C) on power supply pcb.</p> <p>With a gas service failure indication check that relay contacts open and break the circuit between the relay terminals</p> <p>Replace power supply pcb if relay proves to be faulty (Para 4.9)</p>
3. Interconnecting wiring faulty	<p>With a serviceable relay fitted and the fault still evident, the interconnecting wiring to the remote system may be faulty</p> <p>Carry out continuity checks, locate and rectify the defective wiring or replace</p>
4. Remote alarm system faulty	Investigate fault, repair or replace remote system as necessary

TABLE 11:
GAS SERVICE INDICATES NORMAL WITH A GAS SERVICE FAILURE CONDITION

<i>Possible cause</i>	<i>Remarks/rectification action</i>
1. Gas service failure set incorrectly	Check that the gas service sensor is operating at the correct pressure
2. Faulty wiring	<p>Carry out resistance checks between input and alarm panel (Table 9)</p> <p>Repair/replace defective wiring as necessary</p>
3. Power supply pcb faulty	Replace power supply pcb (Para 4.9)
4. Light display pcb faulty	If all other checks have failed to rectify the fault, replace the light display pcb (Para 4.8)

TABLE 12 :
SYSTEM ALARM AND AUDIBLE FAIL TO OPERATE ON POWER FAILURE

<i>Possible cause</i>	<i>Remarks/rectification action</i>
1. Back up battery faulty	Replace back up battery (Para 4.10)
2. Main ribbon connector faulty	Check main ribbon connector on power supply pcb. Replace power supply pcb as necessary (Para 4.9)
3. Main ribbon damaged	Check main ribbon cable. If damaged replace light display pcb (Para 4.8)
4. Power supply pcb faulty	Replace power supply pcb (Para 4.9)
5. Light display pcb faulty	If all other checks have failed to rectify the fault, replace the light display pcb (Para 4.8)

5. FAULT DIAGNOSIS

continued

TABLE 13 :
A GAS SERVICE DISPLAY FLASHING (INCLUDING NORMAL) WITH SYSTEM ALARM

Notes...

1. Check status of other panels which display that particular gas service. If gas service display is flashing carry out steps 1-5 inclusive.
2. If the gas display on other alarm panel is illuminated carry out steps 4 and 5.

<i>Possible cause</i>	<i>Remarks/rectification action</i>
1. Power supply failure to alarm panel which receives input.	Check power supply to alarm panel which receives gas service input
2. Faulty input/wiring	Carry out resistance checks between gas service sensor and input alarm panel
3. Input power supply board faulty	Replace power supply pcb (Para 4.9)
4. Transmission between input and other panels faulty	Check for continuity of data transmission cables between panels. Repair/replace as necessary
5. Light display faulty	Either input or repeat panel may be faulty. Replace light display pcb on input panel (Para 4.8). Replace light display pcb on repeat panel.

6. RECOMMENDED SPARES

Power supply pcb (100 to 127V a.c)	Part No.	1828824
Power supply pcb (200 to 240V a.c)	Part No.	1828801
Light display pcb	Part No.	1828802
Back up battery assembly	Part No.	1828825
Green LED indicator	Part No.	1824613
Yellow LED indicator	Part No.	1824612
Red LED indicator	Part No.	1824611
Power on LED indicator	Part No.	1826489
System alarm LED indicator	Part No.	1826490
Fuse 500mA	Part No.	1826675
Fuse 1A	Part No.	1825372
Fuse 2A	Part No.	1825373
Line contact monitor module (double)	Part No.	1826499
Line contact monitor module (single)	Part No.	1826618
Alarm panel cover	Part No.	1828800
Alarm panel fascia	Part No.	1828799
Power supply pcb relay interface (100 to 127V a.c)	Part No.	1828753
Power supply pcb relay interface (200 to 240V a.c)	Part No.	1828828
Relay pcb	Part No.	1828827

6.1 Spares scheduling

The recommended holding of spares depends upon the number of alarm panels installed and is detailed at table 14. The number recommended for overseas customers is expressed in brackets and takes into account expected transport delays.

**TABLE 14 :
MINIMUM RECOMMENDED SPARES SCHEDULING PER ANNUM**

Part Number	Number of alarm panels installed		
	5 - 10	10 - 15	15 - 25
1828824/1828801	1 (2)	2 (4)	3 (5)
1828802	1 (1)	2 (2)	2 (3)
1828825	1 (2)	2 (4)	3 (5)
1824611-1824613	6 (9)	6 (12)	9 (18)
1826675/1825372	2 (4)	4 (8)	6 (12)
1826675	2 (4)	4 (8)	6 (12)
1826489	1 (2)	3 (6)	3 (6)
1826490	1 (2)	3 (6)	3 (6)
1826489	1 (2)	3 (6)	3 (6)
1826490	1 (2)	3 (6)	3 (6)
1826499	2 (4)	3 (6)	4 (8)
1826618	2 (4)	3 (6)	4 (8)
1828753/1828828	1 (2)	2 (4)	3 (5)
1828827	1 (1)	2 (2)	2 (3)

Ref. Number: 1829803
Issue: 1 2
Issue ref.: X712 DCR859
Issue date: 02/04/99 18/09/99
By: BJ BJ



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